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# Production of Radishes

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The radish is a member of the well-known mustard family, being related to cabbage, cauliflower, horseradish, kale, turnips, and other members of this group of plants. It has been in cultivation for ages, having been grown and used by the ancient Egyptians and Greeks. The radish is one of the most popular home-garden vegetables, and it is of considerable importance commercially. Available statistics show that several thousand acres are devoted to it. In the Norfolk section of Virginia and in Arkansas, Mississippi, Louisiana, Texas, and other Southern States, where radishes are extensively grown as a winter crop, it is not uncommon to find large fields of radishes, some counties having several hundred acres.

## Climatic and Soil Requirements

The radish is a cool-weather, short-season crop that will not withstand extreme heat or drought. In the South its culture is carried on during the cooler portions of the year. In the North it is grown during spring and autumn, both summer and winter being too severe for it. Radishes are grown to some extent in winter as a frame crop in locations in the Central and Northern States where mild winters prevail, and also on the Pacific coast.

Radishes are grown on practically all types of soil, but for the winter and spring crop a light friable sandy loam is regarded as best. For autumn culture a somewhat heavier soil such as a moist clay loam is preferred. Soils that do not bake are best, especially for the spring crop, as a crust interferes with the emergence of the plants and hinders cultivation. The land should be entirely free from stones and other obstructions that would interfere both with cultivation and the formation of the roots. The preparation of land for radish culture is the same as for other root crops. It should be thoroughly pulverized to a depth of 7 or 8 inches.

## Fertilizers

The growth period of radishes is short, and they require a soil with plenty of readily available plant food. Well-rotted manure may be used, but it is better to use the manure on some preceding crop perhaps a year in advance.

Commercial fertilizer should be in a readily available form, because the period of growth of the crop is short. A complete mixture containing about 6 percent of nitrogen, 8 to 10 percent of phosphoric acid, and 6 to 8 percent of potash, broadcast at rates of 1,000 to 1,500 pounds per acre, will usually give good results. In cases where radishes follow some heavily fertilized crop it may be possible to reduce the rate of application to the radishes.

In many sections the rather low value per acre of radishes may make it uneconomical to make a heavy outlay for fertilizer. However, good-quality radishes cannot be obtained from poor soil, and it is useless to attempt to grow them without using enough fertilizer to insure good growing conditions.

Issued March 1938

## Types and Varieties

Radishes are divided into two groups with reference to the season when they are grown. The first group includes the short-season spring and summer varieties, represented by the French Breakfast, Scarlet Turnip, and Early Scarlet Globe, which are globular, and the Cincinnati Market, White Icicle, and Lady Finger or Long White Vienna, which are long in shape. The second group includes the winter or storage varieties, represented by the Black Spanish, Chinese Rose Winter, and Chinese White Winter. This group is grown during autumn and may be marketed immediately or stored like other root crops. The spring and summer varieties require from 20 to 45 days from seeding to come to good edible size. The winter varieties need more time, usually about 60 days.

## Seed and Seeding

In the home garden a packet of radish seed, which will plant 20 feet of row, is sufficient for a single sowing. This should be followed by successive sowings at 2-week intervals as long as radishes are desired, or until weather conditions interfere. In the market garden or truck field they are usually drilled in 15-inch rows, with a single-row or gang seeder. In some sections, such as Norfolk, Va., they are drilled in beds each of which contains several rows. From 10 to 12 pounds of seed are required per acre, the exact amount depending on the width of the rows, the size of the seeds, and the number of seeds to the foot. Experiments have shown that earliness and uniformity of size are improved by sifting out and discarding the very small seeds. The use of large, uniform-sized seed makes it possible to obtain a more even stand and saves thinning. In friable, well-prepared soils, radish seeds are usually planted from one-half to three-quarters of an inch deep.

## Cultivation

The early or globe varieties can often be grown without thinning, but the long or larger varieties usually require thinning to stand 1 to 2 inches apart in the rows.

The cultivation of radishes is simple, only the amount needed for the control of weeds being done. The work is usually accomplished with a wheel hoe, supplemented by such hand weeding as may be necessary. Radishes require an abundance of moisture, and some form of irrigation is essential during periods of insufficient rainfall.

## Disease and Insect Enemies

Owing to the shortness of their growing period radishes are not, as a rule, seriously affected by diseases, but there are a number of insects, including aphids, root maggots, and flea beetles, that attack the growing crop. In view of the constant progress that is being made in methods of control the reader is advised to consult his county agent or to apply to his State experiment station or to the United States Department of Agriculture. Farmers' Bulletin No. 1371 contains information on the Diseases and Insects of Garden Vegetables.

## Harvesting and Handling

Spring and summer radishes are pulled when they reach a suitable size, tied usually 6 to 12 in a bunch, washed, and packed in hampers, baskets, or crates for handling.

The United States standards for bunched radishes provide that unless otherwise specified, U. S. Grade No. 1 shall be at least five-eighths of an inch in diameter, that the bunches shall be of fairly uniform size, and that the radishes in the individual bunches shall not vary more than one-quarter of an inch in diameter. Certain allowances are made for slight variations. Complete information in regard to these standards may be obtained from the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

A wide variety of shipping packages is used in different sections. It should be borne in mind that the sizes of certain baskets and hampers must conform to the standards set by the Standard Containers Act. When shipped in carload lots, radishes are usually handled under refrigeration, and ice is frequently placed on top of the load in addition to the ice in the bunkers. Snow ice is also placed within the packages when the radishes are to be shipped long distances.

## Forcing

Radishes are forced in coldframes, flue- and pipe-heated hotbeds, sash greenhouses, and standard sash-bar and glass forcing structures. Owing to the hardiness of the radish, it may be successfully grown in inexpensive forcing structures with comparatively small expenditures for fuel. In sections where mild winters prevail, a glass or cloth-covered cold frame usually gives all the protection needed. In more northerly sections a flue- or pipe-heated hotbed or sash greenhouse may be used to grow radishes during early spring and sometimes in late autumn. The standard greenhouse with a heating plant that is capable of maintaining suitable temperatures irrespective of weather conditions may be used for forcing radishes at any time during the winter. Radishes are usually grown in this type of greenhouse chiefly as an intercrop with lettuce, cauliflower, or some other cool crop, because they need only a few weeks to develop and are usually out of the way before the entire space is needed by the companion crop.

Methods followed in forcing radishes are very similar to those employed in their outdoor culture. The time of planting is determined by the location, the kind of forcing structure available, and the season, because the culture of radishes in forcing structures is impracticable during summer months. The quick-maturing globe-shaped varieties, such as Early Scarlet Globe and Rosy Gem, are almost invariably used. These sorts will give a crop of marketable-size radishes about a month after seeding.

The maintenance in the forcing structure of day temperatures of about 55° to 60° F. and night temperatures some 10° lower will give good results.

On the whole the forcing of radishes is comparatively simple, but there is a limited demand for the product at prices that will yield a profit above the cost of production. During recent years the competition of outdoor-grown radishes from the South often makes it impossible to force them profitably.

U. S. GOVERNMENT PRINTING OFFICE: 1938

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